Published in final edited form as:

Cancer Nurs. 2020 ; 43(1): E22–E29. doi:10.1097/NCC.0000000000000657.

Issues in Recruiting and Retaining Asian American Breast Cancer Survivors in a Technology-Based Intervention Study

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Abstract

Background: Difficulties in recruiting and retaining Asian Americans in traditional research have been well-documented. Despite an increasing number of technology-based cancer studies among racial/ethnic minorities, little is still known about potential issues in recruiting and retaining racial/ethnic minority cancer survivors for technology-based intervention research.

Objective: This discussion paper aims to examine issues in recruiting and retaining a group of racial/ethnic minorities—Asian American breast cancer survivors—for a technology-based intervention study.

Methods: The parent study is an ongoing large-scale national-scope technology-based intervention study among a target number of 330 Asian American breast cancer survivors. During the recruitment and retention process, research diaries were written by research team members,

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Conflicts of Interest: None of the authors have any conflicts of interests to report.

and the written records of weekly research team meetings were kept. The written records were analyzed using a content analysis. Then, the themes were used to support the discussion points made in the paper.

Results: There existed sub-ethnic differences in research participation; it was easier to recruit Chinese participants compared with other sub-ethnic groups. The use of culturally-matched research team members and multiple languages was essential. Gatekeepers were also elemental for recruitment and retention. Various motivation strategies were needed to retain the participants. Each sub-ethnic group used different communication apps. Finally, trust-building was essential to retain the participants in the intervention.

Conclusions: Researchers need to consider these practical issues in future technology-based intervention research.

Implications for Practice: These issues need to be considered in future program/intervention development and implementation among racial/ethnic minority cancer survivors.

Keywords

Asian American; breast cancer; survivors; technology; recruitment; issues

Even in traditional research, difficulties in recruiting racial/ethnic minorities have been often noted.¹⁻³ Racial/ethnic minorities have been frequently underrepresented in research partially due to difficulties in recruitment.¹⁻³ Well-known reasons for the difficulties in recruitment include racial/ethnic minorities' suspicion on clinical research and low perceived benefits of research participation.^{2,3} Additionally, cultural beliefs and misconceptions could be a reason for racial/ethnic minorities' hesitance to participate in a research study; for instance, due to the cultural beliefs and misconceptions related to breast cancer (e.g., stigma attached to breast cancer), Chinese breast cancer survivors keep their cancer secret and are not willing to participate in research studies.⁴

With recent advances in computer and mobile technologies, an increasing number of researchers began to use computer and mobile technologies in their studies.^{5,6} Dozens of articles reported the benefits of the Internet as a research method or medium and supported the use of technology-based methods in both quantitative and qualitative research.^{5,6} In recent years, an increasing number of researchers also adopt computer and/or mobile technologies for development of interventions for health promotion, disease prevention, and management of chronic diseases.⁷⁻⁹

At an early stage of technology-based research using computers and the Internet, researchers were optimistic about using the technologies to recruit research participants including racial/ethnic minorities because of anonymity provided in non-face-to-face interactions through the Internet.¹⁰ Unlike this prospect, however, recruiting racial/ethnic minorities was still difficult even in technology-based studies.¹⁰⁻¹⁵ Reportedly, the recruitment process in technology-based studies was much more complicated and challenging compared with that in traditional research mainly due to inherent characteristics of Internet interactions and the selected population of Internet users.^{10,11,13,15} Due to non-face-to-face interactions in technology-based studies, determining race/ethnicity of research participants was dependent on their

self-reports as well.¹⁰ Furthermore, technology users are usually with high-income, highly educated, and technology-savvy.^{16,17} For all these reasons, various strategies have been adopted to have an adequate and balanced number of authentic racial/ethnic minorities. Without them, researchers could easily fail to recruit the target number of actual racial/ethnic minorities.¹⁸ Despite these findings on technology-based research in general, little is still known about the challenges in recruiting and retaining racial/ethnic minority cancer survivors for technology-based intervention studies.

In this paper, based on a technology-based intervention study among Asian American breast cancer survivors, issues in recruiting and retaining racial/ethnic minority cancer survivors in technology-based intervention research are discussed. This paper is one of the first papers that address recruitment and retention issues in technology-based intervention research among racial/ethnic minority cancer survivors, especially Asian American breast cancer survivors. This discussion paper aims to share the research team's first-hand experience in the participant recruitment and retention process. By considering the issues, many of the pitfalls in recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research could be avoided in future cancer research. First of all, the parent study that is the basis for discussion in the paper is briefly presented. Then, the method used to identify the recruitment and retention issues is described. Then, the identified issues are discussed, and suggestions for future directions in recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research are proposed.

The Study

The purpose of the parent study is to determine the effectiveness of a technology-based information and coaching/support intervention on improving Asian American breast cancer survivors' survivorship experience. The Institutional Review Board of the institute where the study has been conducted approved the study. Electronic informed consent was obtained from all the participants of the study. The study included only three sub-ethnic groups of Asian Americans (Chinese, Koreans, and Japanese). The three groups were chosen because they were the largest sub-ethnic group (Chinese),¹⁹ the most rapidly increasing sub-ethnic group (Korean),¹⁹ or the group at the highest risk of breast cancer (Japanese).²⁰

The parent study is an ongoing 5-year randomized repeated measures pretest/posttest control group study among a target number of 330 Asian American breast cancer survivors. The participants have been recruited through social media groups, Internet communities/groups, and communities/groups for Asian Americans. The participants who were recruited from January 2017 to May 2018 included 94 Asian American breast cancer survivors: a total of 259 women visited the project website; 124 women were screened to be eligible for the study; and only 94 women completed the pre-test questionnaire. The intervention group uses the program and the American Cancer Society (ACS) website on breast cancer for 3 months while the control group uses only the ACS website for the same period.

Multiple instruments are used to collect the data on primary and secondary outcomes of the study; 14 items on background characteristics, 8 items on disease status (e.g., perceived

general health, length of time since diagnosis, and type and stage of cancer), the Support Care Needs Survey-34 Short Form,²¹ the Memorial Symptom Assessment Scale-Short Form,²² and the Functional Assessment of Cancer Therapy Scale-Breast Cancer.²³ The instruments had established reliability and validity among Asian Americans (Cronbach's alphas = .76-.96). While the study is ongoing, more details on the study are available elsewhere (to be added).

Methods

To determine the issues in recruitment and retention of Asian American breast cancer survivors in a technology-based intervention study, themes reflecting the issues were extracted using a content analysis by analyzing the minutes of research team meetings and research diaries of research team members. Again, this is a discussion paper, and the themes from the minutes and research diaries were used just to support the discussion points made in this paper.

Throughout the recruitment and retention process, the research team kept the meeting minutes (over 50 single-spaced pages) and research diaries (over 200 single-spaced pages) on the issues in recruitment and retention of Asian American breast cancer survivors. A total of 91 meetings were held, including 90 meetings among the research team members and one consultation meeting with a consultant. The project coordinator wrote meeting minutes (not audio-recorded), which typically contained discussions on the progress of recruitment, strategies for recruitment and retention, all other research-related issues that need immediate or long-term solutions, plans for the next 2–4 weeks, and discussions on unique cases. The meeting minutes were shared with all attendees to ensure transparency and consensus on what was discussed in the meetings.

Research diaries were recorded in a standardized template by the interventionists who were culturally matched with the participants. The diaries included the nicknames of participants, time points that coaching occurred, the number of coaching sessions, what happened during coaching sessions, participants' reactions or responses to coaching sessions, plans for the next sessions, and interventionists' own notes or reflections. No predetermined questions were used for the research diaries since coaching during the intervention sessions depended on the participants' unique needs with different problems.

For this paper, the research team used only the parts of the minutes and research diaries that were relevant to the recruitment and retention issues. The minutes and diaries were analyzed using a content analysis.²⁴ The unit of analysis was words in the minutes and diaries. Line-by-line coding was conducted to analyze the minutes and diaries. Then, categorization was done with the line-by-line codes. Finally, six themes reflecting recruitment and retention issues were extracted from the codes. The extracted themes were reviewed by all research team members to confirm the validity of the themes (for member validation). The themes were then finalized upon the agreement of all research team members.

Recruitment and Retention Issues

The six themes on the recruitment and retention issues include: (a) sub-ethnic differences in interests on research participation; (b) the necessity of culturally-matched research team members and multiple languages; (c) the essential roles of gatekeepers; (d) various motivation strategies; (e) ethnic-specific communication apps; and (f) trust-building. Again, the parent study is an ongoing 5-year research project. Thus, these themes were derived only based on the 2-year experience of recruitment and retention. Each issue is discussed in detail as follows.

Sub-ethnic Differences in Interests on Research Participation

In general, Asian Americans are one of the racial/ethnic groups that cannot be easily recruited to research studies.²⁵ Subsequently, the difficulties in recruiting Asian Americans, especially Asian American breast cancer survivors, were expected in a way. Considering that breast cancer is a stigmatized condition in some sub-ethnic groups of Asian Americans,^{26,27} the difficulties in participant recruitment and retention were obvious from the beginning of the study implementation. Indeed, for 1.5 years (from January 2017 to May 2018), a total of 94 eligible participants (54 Chinese, 21 Korean, and 19 Japanese) were recruited; some participants were lost during the study period without clarifying the reasons for their actions, but no participant had officially withdrawn from the study.

One plausible reason for Asian Americans' lack of participation in research in general would be their early experience with the U.S. authorities and subsequent mistrust toward government and medical research. Historically, Asian Americans experienced the Gentleman's Agreement between the U.S. and Japanese Governments that prohibited the immigration of Japanese men while allowing Japanese women and children to stay in the U.S.²⁸ Also, they have experienced the Naturalization laws (passed in 1790 and modified in 1870) that excluded Asians from citizenship until 1952.²⁸ In addition, they experienced the internment of Japanese Americans during the World War II.²⁸ These historical facts about Asian Americans and their immigration might have influenced Asian American culture and subsequently induced Asian Americans' hesitancy in participating in research projects; they may perceive that they could be possibly exploited through research projects. Indeed, studies have reported racial/ethnic minorities' mistrust toward government and medical research.²

Another factor to consider would be differences in health care systems between the U.S. and their countries of origin. China, Taiwan, Korea, and Japan have national health insurance systems that cover most of medical expenses even for their people outside their countries (e.g., Chinese Americans). Many Asians residing in the U.S. might not seek health care in the U.S.; instead, they would go back to their own country of origin to receive necessary health care services. For instance, Japanese women diagnosed with breast cancer would go back to Japan for surgeries or chemotherapies because their medical expense in Japan could be much lower than that in the U.S. Subsequently, they would find it unnecessary to participate in research studies conducted in the U.S., especially those using English only.

As shown in the numbers of participants per sub-ethnic group (54 Chinese, 21 Korean, and 19 Japanese), the recruitment of Chinese women was easier than that of Korean and

Japanese women. Chinese women tended to be more willing to participate in the study while Korean and Japanese women were more hesitant to be involved in it. Notably, the recruitment and retention of Japanese women were the most difficult part of the study implementation. This could be a new finding that adds to the existing body of knowledge since the previous literature has not reported such sub-ethnic differences. Yet, this finding may simply reflect the greatest proportion of Chinese Americans among the entire Asian American population. While about 4.8 million Chinese Americans reside in the U.S., only 1.6 million Korean Americans and 1.4 million Japanese Americans reside in the U.S.¹⁹ Subsequently, online communities/groups related to breast cancer and their users in Chinese communities could outnumber those in Korean or Japanese communities. However, even when considering this difference in the population sizes, apparent sub-ethnic variations were noted in the women's willingness to participate.

Within the participants, yet, there were no significant sub-ethnic differences in their sociodemographic characteristics (e.g., age, marital status, and income), except for education and religion. Korean (85.7%) and Japanese participants (89.5%) were more likely to have college or graduate degrees compared with Chinese participants (61.1%). Korean participants (90.5%) were more likely to have a religion, followed by Chinese (53.7%) and Japanese participants (31.6%).

Culturally-matched Research Team Members and Multiple Languages

As in traditional research among racial/ethnic minorities in general,^{2,29–31} culturally matched and competent research team members were essential in recruitment and retention of Asian American breast cancer survivors. However, cultural matching needs to be made at the level of sub-ethnicity. The inclusion of an Asian American in a research team would not guarantee cultural competence of the study. Rather, since three sub-ethnic groups of Asian Americans (Chinese, Korean, and Japanese) were included in this study, we needed research team members who were culturally matched to these three sub-ethnic groups (e.g., Chinese American research assistants for Chinese American women). At the beginning of recruitment, we readily assumed that contacts by Asian American research staff would work to get assistance from Asian American communities/groups for recruitment. However, none of Chinese communities/groups contacted by Korean research assistants responded to our requests for study announcements. Later, when a Chinese American research assistant contacted, Chinese American communities/groups responded to the research team.

The use of multiple languages was also an essential part of the recruitment process. The participants were allowed to select a language to use in their research participation (e.g., English, Mandarin Chinese, Japanese, or Korean). Yet, even with four languages, we could not cover all the diversities in languages; there existed different dialects even within one sub-ethnic group (i.e. Chinese Mandarin vs. Taiwanese Mandarin). Except the cases that the participants could not use one of the languages (e.g., Chinese speaking Cantonese), the use of multiple languages facilitated the study announcement, recruitment, and retention process of the study.

The literature is clear that those with limited language proficiency often tend to refrain from asking questions.³² Indeed, many participants of this study often pointed out their language

barriers in using current health care systems. The fact that they could use their native languages was one of the reasons that they wanted to participate in this study. The participants appreciated the sessions of coaching/support in their native languages throughout the intervention because they could understand the educational content better in their native languages. According to one Chinese participant, “Indeed, you are helping me a lot. You are so knowledgeable to answer my questions.” Another Chinese participant said, “I didn’t know why I need to take vitamin B12 after the gastric surgery until you explained it to me.”

They also preferred their native languages to English for completing the questionnaires even when they could read and write in English. Furthermore, the use of native languages facilitated the communication process between research team members and gatekeepers as well as participants, which subsequently helped the gatekeepers and participants effectively understand the recruitment process, participant requirements, and research procedures.

Gatekeepers

The participant recruitment only through social media sites and Internet communities/groups was not effective in this study. Rather, the assistance of gatekeepers (e.g., webmasters of Internet communities/groups, directors of Asian American communities/groups, pastors of Asian American churches) was essential in the recruitment. Getting entrée through gatekeepers has been emphasized in previous studies among racial/ethnic minorities.^{2,29,31,33} When we announced the study only through social media sites and Internet communities/groups, we did not recruit many participants. Yet, once the gatekeepers began to engage in the study announcement and recruitment process, we began to recruit an increasing number of Asian American breast cancer survivors. A total of 106 gatekeepers have been involved in the participant recruitment.

Getting access to the gatekeepers necessitated networking and trust-building. The gatekeepers who were introduced through the research team members (e.g., consultants) were more willing to help the participant recruitment. Trust-building was the essential step to receive their help as well. Phone calls, rather than e-mail communication, worked better in soliciting their help. Also, providing some monetary incentives (e.g., donation to the organization) helped garner their assistance. Visiting their organizations and presenting the study among their members were often recommended by the gatekeepers. Additionally, regular communication (e.g., phone calls, text messages, emails, etc.) with gatekeepers enhanced trust-building with them.

During the communication, we adopted several strategies for effective communication and trust building. For example, we tried to keep our conversation simple and clear, outlined the research procedures plainly, used a positive tone throughout the communication process, and made comments on our appreciation to gatekeepers’ support. While making phone calls, we tried not only to respect gatekeepers’ time (by keeping the initial conversation brief), but also not to divulge more than what was necessary. Also, the research team members prepared confident and assertive answers before the phone calls so that they could make effective phone calls with the prepared answers. When sending out an e-mail, the members attached visual flyers (e.g., newsletters), which was more persuasive and had a greater

impact on recruiting participants through the gatekeepers compared with simple text messages.

It was important that the research team members needed to be fully honest with the gatekeepers and not hesitant to point out a challenge or a problem to build trustworthy relationships. Research team members' genuine care for the participants was also an important factor to convince the gatekeepers to help the recruitment of participants. Surely, the research team members' attitudes of appreciating the gatekeepers' professional assistance was another important factor in building trust with the gatekeepers. The research team needed to maintain consistent contacts with the gatekeepers; it was helpful for the interventionists to develop their own systems of follow-ups in order to maintain the contacts with the gatekeepers.

Various Motivational Strategies

Monetary motivational strategies have been criticized on their unexpected impact on research participants such as potential exploitation of low-incomed participants and potentially attracting unauthentic cases.^{34–36} Yet, Bentley and Thacker³⁷ reported that monetary motivational strategies affected positively on research participation (increased the participants' willingness to participate), but higher monetary compensation influenced participants' behaviors related to hiding some information about restricted activities required for participants to report. However, they also documented that the monetary compensation did not affect participants' tendency to report/neglect negative effects.

In this study, \$50 electronic gift certificates were provided to the participants who completed three times of questionnaires while participating in the 3-month intervention. There existed some sub-ethnic differences in the women's perception on the monetary motivation strategy. The monetary compensation worked very well for Chinese participants, but not for Korean and Japanese women. A few Korean participants complained that \$50 was too little for their 3-month research participation while none of Chinese participants complained about the reimbursement amount. Most of the participants across the sub-ethnic groups perceived that the monetary incentive was meaningless to them, and they participated in the study to get some help for their survivorship experience or help others in the same situations. According to one Japanese interventionist, "all of my participants wanted to repay to other survivors in a way because everyone helped them in fighting against their cancer."

Another motivation strategy that helped recruit research participants was to emphasize the benefits of the study (e.g., providing information and personal and group coaching/support throughout the 3-month period). Potential research participants who were in needs of information and coaching/support in their survivorship process were more than willing to participate in the study when they recognized the potential benefits of getting information and coaching/support from culturally-matched health care professionals (registered nurses). Also, convincing the importance of the study played a central role in motivating potential participants to join the study. Given that Asian Americans have rarely been represented in existing health research,^{38–40} this study was unique in terms of its focus on three sub-ethnic groups of Asian Americans. The uniqueness of this study focusing on Asian Americans also

made a couple of gatekeepers be excited about the study and willing to help the recruitment for the study.

To retain the participants in the intervention, it was important to provide several ways to monitor their own progress with goals of building confidence and persistence and solving their issues/concerns. Thus, the symptom log function that was included in the intervention provided a way for the participants to monitor their progress in symptom management. Also, weekly texting to set weekly goals and checking their progress worked very well for the participant retention.

Another successful strategy in retaining the participants was providing an educational session related to participants' issues/concerns in their daily lives. The session dealt with real life issues while providing practical health promotion skills or techniques that could be directly applicable to their daily life. This kept the participants interested in the educational sessions and links included in the study. One Chinese participant stated, "I believe you because... I tried the strategies for sleeping that you suggested and they seem to work for me!"

The research team also needed to update the resources included in the intervention to meet current professional standards and provide the state-of-science knowledge in order to increase the participants' interests in the study, maintain their motivation, and help them gain a new perspective. At the same time, it was important to acknowledge the participants' powerlessness, economic adversity, or limited time (due to social conditions) as real barriers that could prevent the participants from continuing their participation in the study.

Ethnic-specific Communication Apps

According to the original study plan, social media and chatting functions of the project website were supposed to be used for group and individual coaching/support for the intervention. Yet, during the first month of intervention, the interventionists noticed that the participants were using specific communication apps widely used in their subethnic communities to talk with the interventionists (e.g., *WeChat* among Chinese participants, *KakaoTalk* among Korean participants, and *Line* among Japanese participants). When the interventionists sent messages for coaching/support through the chatting function in the project social media sites, the participants rarely responded to them. Also, when the interventionists tried to contact the participants by email, their responses were not prompt. It took typically 1 or 2 weeks for the interventionists to hear from the participants through the chatting function or email. Then, the participants themselves suggested the use of communication apps that they were using on a daily basis. Thus, the research team adopted the ethnicity-specific apps to be connected with the research participants with an IRB modification. Typically, the communication apps provide a range of handy communication functions (e.g., group chatting, individual chatting, texting, voice talks, video talks, and emoji) and allow using any languages that the participants wanted to use. The participants could send messages via texts and pictures to the interventionists. Indeed, one Chinese interventionist documented, "the participants like to post their thoughts on the WeChat and also enjoy showing their pictures." Through these ethnic-specific communication apps, the interventionists could continuously get in touch with the participants, and the participants

could contact the interventionists at their convenience. Yet, during the communication process, the research team needed to ensure that any private information should not be shared through the apps at all.

A potential issue of using the communication apps was the interventionists' heavy burden of research works. Due to the nature of a nation-wide study, the participants resided across the U.S., some of whom lived in Hawaii. The time zone differences between the east coast where most of the interventionists resided and the place where the participants resided made the interventionists get messages from the participants at unusual times (e.g., 2:00 am). The interventionists often reported their heavy burden of administering the intervention. One Japanese interventionist raised a concern saying "I'm contacting with Jxx in California. Even when we scheduled a chatting at 6 pm, PST (Pacific Standard Time), she said that she could be late due to overtime work and wanted to talk at 8 pm PST (11 pm, Eastern Standard Time). I could not make it at 11 pm. Also, she wanted the mornings of weekends (PST 8 or 9 am), but I could not promise around noon during the weekends either. It is difficult to arrange our coaching sessions due to the time differences between the areas. I am wondering how much I should meet her request."

Trust-building

As mentioned above, racial/ethnic minorities are well-known for their mistrust toward outsiders (e.g., government and medical research).^{2,25} In general, obtaining racial/ethnic minorities' trust is the most crucial step in the recruitment and retention of racial/ethnic minorities into research studies,^{2,29,31,33} which was corroborated by this study.

One of the situations frequently encountered by the research team during recruitment was the requests of participants and gatekeepers for more information on the study. The institute where the study was conducted had strict rules on the content of study announcements; for instance, they did not allow including information on participant reimbursement. Thus, the research team could not add details of the study (e.g., the amount of compensation), which made potential participants want more information all the time. The participants were willing to participate in the study after reviewing all the information needed to make a decision. Similarly, gatekeepers were reluctant to help the recruitment of research participants without sufficient information. The research team had to have frequent conference calls and e-mails to answer questions from the gatekeepers. During the process, phone calls were better in trust building with the gatekeepers than were emails or text messages.

The survivors themselves often became great gatekeepers as well. For instance, we had a participant who was an active blogger. While she was participating in the intervention, she never mentioned about her blog. However, after she went through her intervention for three months and completed the post-3 month survey, she volunteered to help the recruitment as a gatekeeper. She waited for three months to go through the intervention for self-evaluation and finally offered help for the study because she perceived the benefits of the study.

The research team members' clinical expertise and experience were important factors in establishing trustable relationships with the participants as well. The participants themselves

carefully observed the interventionists' communication skills and ability to convey their expertise in the field, evaluated the sincerity of their interactions with them, and considered whether or not interventionists were motivated to act as advocates for them. Also, the process of building trust was associated with the interventionists' respect, openness, and willingness to talk and listen, their emotional availability, and their ability to maintain confidentiality. Furthermore, the research team members' attitudes and responses to the participants contributed to retaining the participants; the interventionists' careful attention to the participants' responses and their changing motivation made the participants feel respected and want to continue in the study. Importantly, soliciting the participants' feedback and satisfaction with each session made them actively engaged in the process. One Japanese participant stated, "I was wondering how much I could talk with somebody with whom I was not acquainted. But I was able to talk about anything because of your sincere attitudes and listening like a counselor." At the end of the study, even one Chinese participant talked to her interventionist, "I am happy to know you; and we are a good friend now."

Suggestions for Future Recruitment and Retention

Despite an increasing number of technology-based interventions among racial/ethnic minorities, little is still known about the issues in recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research.^{10–15} Based on the above discussion on recruitment and retention issues, the following suggestions are made for future recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research. First of all, researchers need to consider sub-ethnic differences in potential research participants' interests in research participation. As discussed above, there certainly existed sub-ethnic differences in research participants' willingness to participate in the study. However, the reasons for such differentials are not known yet. Further studies on the reasons would shed some lights on the directions for future recruitment and retention of racial/ethnic minorities in technology-based intervention research.

Second, culturally-matched research team members and multiple languages were essential in recruiting and retaining Asian American breast cancer survivors in this study. For future recruitment and retention of racial/ethnic cancer survivors in technology-based intervention research, the use of culturally-matched research team members and multiple languages are strongly recommended as in traditional research among racial/ethnic minorities in general.^{2,29–31}

Third, the use of gatekeepers was essential in reaching out to potential participants and recruiting them into our study. Thus, for future recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research, soliciting help through gatekeepers is recommended. To get their help, it would be necessary to provide detailed information on the study, build trust through regular contacts, and offer monetary compensation for their time if possible.

Fourth, adoption of various motivational strategies is recommended for future recruitment and retention of Asian American breast cancer survivors in technology-based intervention

research. Through a pilot study, the effectiveness of various motivational strategies could be tested and prepared for a larger study. Researchers also need to make every effort to keep up with established relationships with gatekeepers and communities/groups for racial ethnic minorities.

Fifth, the use of ethnic-specific communication apps is also recommended for future recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research. Researchers need to make themselves familiar not only with new computer and smart phone technologies, but also with newly developed and used mobile apps and other ethnic-specific digital communication apps through national and international seminars/workshops, continuing education sessions, and conferences. Also, researchers could assist research participants in learning how to use emails, apps, and websites during the study period, which could improve the efficiency in study implementation and give the participants more opportunities to seek out for resources independently in the future.

Finally, cultural values, attitudes, and beliefs related to research participation also need to be considered in future endeavors for recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research. At the beginning of the Internet era, researchers thought that cultural values and attitudes might not influence the interactions through the Internet because people could not perceive others' cultural background due to non-face-to-face interactions that would not disclose physical appearances and characteristics.^{41–43} However, as discussed above, research participants' cultural values, attitudes, and beliefs (e.g. cultural hesitance) could heavily influence racial/ethnic minority cancer survivors' willingness to participate in a study.

Conclusions

In this paper, the workability of recruiting and retaining racial/ethnic minority cancer survivors, especially Asian American breast cancer survivors, in technology-based intervention research was strongly supported with several practical issues to consider. Again, this is one of the first papers that discuss the challenges in recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research using computers and mobile devices. Based on the discussed issues, several suggestions are made for future recruitment and retention of racial/ethnic minority cancer survivors in technology-based intervention research.

Acknowledgement:

This study was funded by the National Institute of Health (NIH/NCI/NINR; 1R01CA203719).

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